



Huntington Power Plant

6 miles west of Huntington, Utah on Hwy. 31
P.O. Box 680
Huntington, Utah 84528

February 26, 2018

Mr. Bryce Bird, Director
Utah Department of Environmental Quality
Division of Air Quality
195 North 1950 West
P.O. Box 144820
Salt Lake City, UT 84114-4820

RE: **1st Quarter, 2018 Particulate Matter Compliance Test Report - 40 CFR 63 SubPart UUUUU,
Huntington Power Plant Unit 1 and Unit 2 (Title V Permit #1501001004)**

Dear Mr. Bird,

In accordance with Title V Permit Condition II.B.3.f.1(b) and 40 CFR §63.10021(d) the Huntington Power Plant submits the 1st Quarter 2018 Particulate Matter (PM) Compliance Test Reports for Unit 1 and for Unit 2.

This submittal is intended to satisfy the report submittals for both units, and includes the portable document format (PDF) report that is submitted electronically via the Emissions Collection and Monitoring Plan System (ECMPS).

The summary results of the 1st Quarter 2018 PM test results are:

Unit	Emission rate (lb/mmBtu)
1	0.004
2	0.005

I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information, or omitting statements and information, including the possibility of fine or imprisonment.

Should you have any questions regarding this information, please contact Richard Neilson, Huntington Power Plant Environmental Engineer at (435) 687-4334 or me at (435) 687-4211.

Sincerely,

Darrell Cunningham
Managing Director and Responsible Official, Huntington Plant

Enclosures: "Source Test Report 1st Quarter 2018 Particulate Matter Testing – Huntington Unit 1"
"Source Test Report 1st Quarter 2018 Particulate Matter Testing – Huntington Unit 2"

cc: David Barnhisel
Steve Jensen
Sara Loiacono, USEPA Region VIII, w/enclosures, by electronic communication

SOURCE TEST REPORT

1st Quarter 2018 Particulate Matter Testing

PaciCorp

Huntington Power Plant Unit 1

Huntington, Utah

Prepared For:

PaciCorp
Highway 31
Huntington, Utah 84528

For Submittal To:

Utah Division of Air Quality
195 N 1950 W
Salt Lake City, Utah 84114

Prepared By:

Montrose Air Quality Services, LLC
990 W. 43rd Avenue
Denver, Colorado 80211

Document Number: **043AS-341317-PP-17**
Submittal Date: **February 15, 2018**



Executive Summary

Montrose was contracted by PacifiCorp to conduct compliance testing at the Huntington Power Plant near Huntington, Utah. Testing was performed to determine emission rates of particulate matter (PM) from the exhaust stack of Huntington Unit 1. Compliance test results are summarized in the table below; detailed test results are given in the following report.

PacifiCorp Huntington Power Plant PM Compliance Test Results Summary						
Source	Parameter	Date	Average Value	Emission Limit		
Huntington Unit 1	Filterable Particulate Matter	2/6/2018	0.004	0.030 lb/mmBtu		
			0.04	0.30 lb/MW-hr		
Each result is the average of three two-hour test runs.						
Abbreviations: lb/mmBtu: pounds per million British thermal units lb/MW-hr: pounds per megawatt hour						

Introduction

Montrose Air Quality Services (Montrose, formerly EMC) was contracted by PacifiCorp to conduct source testing services at the Huntington Power Plant near Huntington, Utah. The Huntington Plant comprises two pulverized coal-fired boilers. Huntington Unit #1 is equipped with low-NO_x burners and overfire air for nitrogen oxides (NO_x) control, a flue gas desulfurization (FGD) scrubber for sulfur dioxide (SO₂) control and pulse-jet fabric filters for particulate matter (PM) control. Testing was conducted in accordance with the requirements of 40 CFR Part 63 Subpart UUUUU, National Emission Standards for Hazardous Air Pollutants (NESHAP): Coal- and Oil-Fired Electric Utility Steam Generating Units.

Contact information for the project is listed in the table below.

Contact	Affiliation	Telephone	E-mail
Frank Zampedri Environmental Analyst	PacifiCorp	(801) 220-2169	frank.zampedri@pacificorp.com
Richard Neilson Environmental Engineer		(435) 687-4334	richard.neilson@pacificorp.com
Rob Leishman Environmental Scientist	UDEQ	(801) 536-4063	rleishman@utah.gov
Scott Bouchard Field Project Manager	Montrose	(303) 495-3936	sbouchard@montrose-env.com

Scope of Work

Testing was performed to determine concentrations and mass emission rates of particulate matter (PM) for comparison to the applicable emission limits listed in the table below.

Source	Regulation	Parameter	Emission Limit
Huntington Unit 1	NESHAP UUUUU	PM (lb/mmBtu)	0.030 lb/mmBtu
		PM (lb/MW-hr)	0.30 lb/MW-hr
Abbreviations: lb/mmBtu: pounds per million British thermal units lb/MW-hr: pounds per megawatt-hour			

Testing Methods

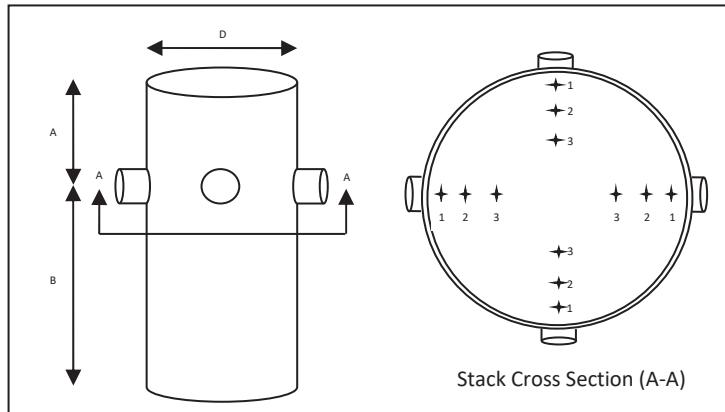
Montrose used the following EPA Reference Methods for the testing program. No deviations from the Reference Methods were noted.

Parameter	EPA Reference Methods	Test Runs/Duration	Target Sample Volume
PM (lb/mmBtu)	1, 2, 3B, 4, 5*, 19	3 @ 2 hr	2 dscm (70.63 dscf)**

*In accordance with Table 5 of NESHAP Subpart UUUUU, the front-half temperature was set at 320° ± 25°F.
**Sample volume from Table 2 of NESHAP Subpart UUUUU, doubled in accordance with §63.10005.

Testing Location

The Huntington Unit #1 exhaust sampling location consists of a vertical, circular stack with four orthogonal sampling ports located at least six diameters downstream and two diameters upstream of the nearest flow disturbances. PM testing was performed across a grid of 12 points determined using EPA Method 1. See the schematic below.



Huntington Test Diagram	
Unit #	1
Diameter (D)	323.3"
Upstream Distance (A)	>220'
Downstream Distance (B)	>266'
Sample Point Distances from Stack Wall	
Traverse Point 1	14.1"
Traverse Point 2	47.3"
Traverse Point 3	95.7"

Test Results

The results of the testing program are given in the tables below. Detailed test results are located in Appendix A, along with sample calculations for all computed values.

Pacificorp Huntington Unit 1 PM Compliance Test Results Summary (2/6/2018)						
Parameter	Run #1	Run #2	Run #3	Average	QA Specification	Emission Limit***
Start Time	7:38	10:20	13:03	—	—	—
Stop Time	9:49	12:31	15:14	—	—	—
Sample Gas Volume (dscf)	78.96	77.63	77.95	78.18	>70.63*	—
Isokinetic Variation (%)	95.7	94.9	95.4	95.3	100 ± 10%	—
Filterable PM (lb/mmBtu)	0.005	0.003	0.004	0.004	—	0.030
Boiler Load (MW)	482	483	483	483	>468**	—
Filterable PM (lb/MW-hr)	0.04	0.03	0.04	0.04	—	0.30

* Sample volume from Table 2 of NESHAP Subpart UUUUUU, doubled in accordance with §63.10005.
**90% of design capacity, in accordance with §63.10007(a)(2).
***As shown, average PM emissions were less than 50% of the applicable emission limit, qualifying the unit for Low Emitting EGU (LEE) status.

Testing Equipment

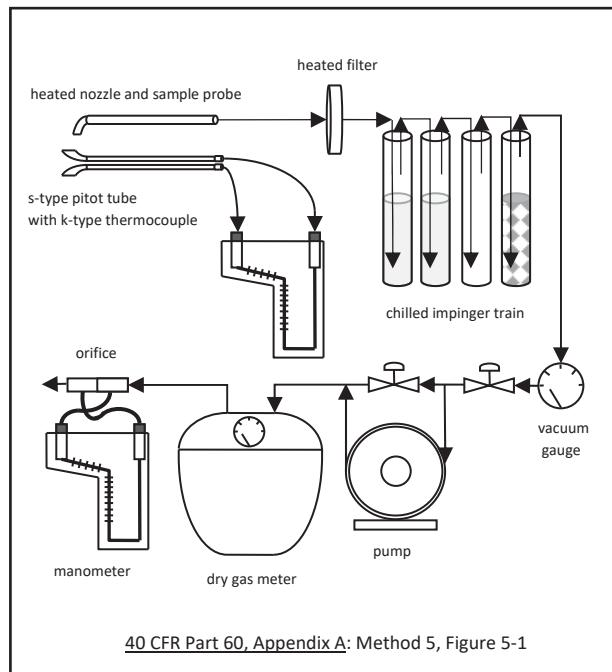
All testing equipment was housed in a climate-controlled mobile analytical laboratory designed and built by Montrose. All required quality assurance tests were performed as required by the applicable Reference Methods. Detailed equipment descriptions are given in the table below.

Parameter	Equipment	EPA Reference Method(s)
Particulate Matter (PM)	Heated probe with glass nozzle and stainless steel probe liner Quartz fiber filter S-type pitot tube K-type thermocouple Inclined-vertical manometer Dry gas meter Digital scale Analytical balance	1, 2, 3B, 4, 5, 19

Test Details

Particulate matter testing was performed using EPA Methods 1, 2, 3B, 4 and 5. Each test run was 120 minutes in duration. Sampling was performed along a grid of points determined using EPA Method 1. Exhaust gas flow measurements were taken using an S-type pitot tube, K-type thermocouple and inclined-vertical manometer in accordance with EPA Method 2. A sample of exhaust gas was withdrawn from the stack at an isokinetic flow rate through a heated stainless steel nozzle and probe, through a heated quartz-fiber filter, through four chilled glass impingers containing known masses of water or silica gel, and through a dry gas meter. (See Figure 5-1 at right.) The default dry molecular weight for combustion sources (30 lbs/lb-mole) listed in EPA Method 3 was combined with pressure and temperature measurements to calculate stack gas velocity in accordance with EPA Method 2. Stack gas moisture concentrations were determined gravimetrically in accordance with EPA Method 4.

Following each sampling period, the filter and rinses of the nozzle and probe were recovered and returned to Montrose's laboratory for gravimetric analysis. Following analysis, the particulate mass captured during each test run was combined with concurrent flow and moisture data to calculate particulate matter emissions in units of pounds per hour (lb/hr). The particulate mass captured during each test run was combined with concurrent CO₂ concentration data from the plant CEMS¹ and the appropriate fuel F-factor from EPA Method 19 (1,800 scf/mmBtu) to calculate PM emissions in units of pounds per million British thermal units (lb/mmBtu) for comparison to the applicable emission limit.



¹ EPA Method 3B §6.0 states "As an alternative to the sampling apparatus and systems described herein, other sampling systems may be used, provided such systems are ... capable of yielding acceptable results." As NESHAP UUUUUU requires certified Part 75 CEMS CO₂ data to calculate SO₂ and mercury emissions in units of lb/mmBtu, CEMS CO₂ data are considered acceptable for PM emission calculations as well.

Appended Information

Supporting data for this testing program are included as follows.

Appendix A: Test Summary

- Data Reduction Spreadsheet
- Sample Calculations

Appendix B: Field Data

- Field Datasheets

Appendix C: Laboratory Data

- Gravimetric Analysis

Appendix D: CEMS Data

- Test Run CEMS Printouts

Appendix E: Calibration Information

- Dry Gas Meter Pre-Test and Post-Test Calibrations
- Critical Orifice Calibration Certificate
- STAC Certification



Appendix A: Test Summary

Data Reduction Spreadsheets

Sample Calculations

043AS-341317
 PacifiCorp
 Huntington Unit 1
 2/6/2018

Θ	Run #	1	2	3
	Start Time	7:38	10:20	13:03
	Stop Time	9:49	12:31	15:14
	Sample Time (min.)	120	120	120

EPA Method 2 Data	1	2	3	Average
Inputs				
D _s Stack Diameter (inches)	323.3	323.3	323.3	323.3
P _{bar} Barometric Pressure ("Hg)	23.48	23.48	23.48	23.5
P _g Stack Static Pressure ("H ₂ O)	-2.5	-2.5	-2.5	-2.5
C _p Pitot Tube Coefficient (unitless)	0.84	0.84	0.84	0.84
VΔp _{avg} Avg. Velocity Head of Stack Gas V("H ₂ O)	0.8276	0.8198	0.8224	0.8233
T _s Stack Gas Temperature (°F)	109	109	110	109
Calculations				
A Stack Area (ft ²)	570.084	570.084	570.084	570.084
P _g Stack Static Pressure ("Hg)	-0.18	-0.18	-0.18	-0.18
M _d Stack Gas Molecular Weight, dry basis (lb/lb-mole)	30.00	30.00	30.00	30.00
M _s Stack Gas Molecular Weight, wet basis (lb/lb-mole)	28.70	28.70	28.66	28.69
P _s Absolute Stack Pressure ("Hg)	23.30	23.30	23.30	23.30
T _{s(abs)} Absolute Stack Gas Temperature (°R)	569	569	570	569
V _s Stack Gas Velocity (ft/sec)	54.8	54.3	54.6	54.6
Q Stack Gas Dry Volumetric Flow Rate (dscf/hr)	72,493,203	71,809,966	71,765,442	72,022,871
Q Stack Gas Dry Volumetric Flow Rate (dscf/min)	1,208,220	1,196,833	1,196,091	1,200,381

CEMS Diluent Data	1	2	3	Average
CO ₂ (%vw)	10.4	10.4	10.4	10.4
CO ₂ (%vd)	11.7	11.7	11.7	11.7

EPA Method 4 Data	1	2	3	Average
Inputs				
V _{lc} Volume of Water Condensed (mL)	221.1	206.6	220.1	215.9
V _m Volume of Stack Gas Collected (dscf)	98.126	97.589	98.337	98.017
Y Meter Calibration Factor (unitless)	0.9988	0.9988	0.9988	0.9988
ΔH Pressure Differential Across Orifice ("H ₂ O)	1.8	1.8	1.9	1.8
T _m Temperature at Gas Meter (°F)	57	63	65	62
Calculations				
P _m Absolute Pressure at Gas Meter ("Hg)	23.61	23.61	23.62	23.61
T _m Absolute Temperature at Gas Meter (°R)	517	523	525	521.7
V _{wc(std)} Volume of Water Condensed (scf)	10.40	9.72	10.36	10.16
V _{m(std)} Sample Gas Volume (dscf)	78.96	77.63	77.95	78.18
B _{ws act} Observed Stack Gas Moisture Content (%/100)	0.116	0.111	0.117	0.115
B _{ws sat} Saturated Moisture Content (%/100)	0.108	0.108	0.111	0.109
B _{ws} Moisture Content Used (%/100)	0.108	0.108	0.111	0.109

EPA Method 5 Data	1	2	3	Average
Inputs				
D _n Nozzle diameter (")	0.244	0.244	0.244	0.244
C1 Mass of PM collected on filter (mg)	6.4	6.8	7.2	6.8
C2 Mass of PM collected in rinses (mg)	4.2	0.3	3.0	2.5
Emission Calculations				
F _c Fuel F-Factor (scf/mmBtu)	1800	1800	1800	1800
A _n Cross-sectional area of nozzle (ft ²)	3.25E-04	3.25E-04	3.25E-04	3.25E-04
I Isokinetic variation (%)	95.7	94.9	95.4	95.3
m _n Total Filterable PM mass less blank (mg)	10.6	7.1	10.2	9.3
C _s Filterable Particulate concentration (gr/dscf)	0.002	0.001	0.002	0.002
C _s Filterable Particulate concentration (lb/dscf)	2.96E-07	2.02E-07	2.88E-07	2.62E-07
E _{lb/hr} Filterable Particulate mass emission rate (lb/hr)	21	14	21	19
Boiler Load (MW)	482	483	483	483
Filterable Particulate mass emission rate (lb/MW-hr)	0.04	0.03	0.04	0.04
F _c Filterable Particulate mass emission rate (lb/mmBtu)	0.005	0.003	0.004	0.004
8760 hrs/yr Filterable Particulate mass emission rate (tons/year)	94	63	91	83

EPA Method 5: Determination of Particulate Matter Emissions (40 CFR Part 60, Appendix A-1)

Variables

Variable	Value	Definition	Unit of Measurement
D _s	323.3	Stack Diameter	inches
A	570.08	Cross-Sectional Area of the Stack	ft ²
P _g	-2.50	Stack Static Pressure	in. H ₂ O
P _g	-0.18	Stack Static Pressure	in. Hg
%CO ₂	11.7	Concentration of Carbon Dioxide	Dry Volume Percent (%vd)
%O ₂	n/a	Concentration of Oxygen	Dry Volume Percent (%vd)
M _d	30.00	Dry Molecular Weight of the Stack Gas (default)	lb/lb-mole
P _{bar}	23.48	Barometric Pressure	in. Hg
ΔH	1.80	Pressure Differential across Orifice	in. H ₂ O
P _m	23.61	Absolute Pressure at Gas Meter	in.Hg
t _m	57	Temperature at Gas Meter	°F
T _m	517	Absolute Temperature at Gas Meter	°R
K1	0.04706	Conversion Factor	ft ³ /mL
V _{lc}	221.1	Volume of Water Condensed	g
V _{wc(std)}	10.40	Volume of Water Condensed	scf
K ₄	17.64	Constant	°R/in.Hg
Y	0.9988	Meter Calibration Factor	Unitless
V _m	98.126	Volume of Stack Gas Collected	dcf
V _{m(std)}	78.961	Sample Gas Volume	dsfc
B _{ws}	0.108	Stack Gas Moisture Content	%/100
M _s	28.70	Actual Molecular Weight of the Stack Gas	lb/lb-mole
P _s	23.30	Absolute Stack Pressure	in. Hg
T _s	109	Average Stack Temperature	°F
T _{s(abs)}	569	Average Absolute Stack Temperature	°R
K _p	85.49	Conversion Factor	(ft/sec) x V(((lb/lb-mole)(in.Hg))/((°R)(in.H ₂ O)))
C _p	0.84	Pitot Coefficient	Dimensionless
AvgVΔp	0.8276	Average Square Root of Velocity Head Readings	in. H ₂ O
V _s	54.83	Average Stack Gas Velocity	ft/sec
T _{std}	528	Standard Absolute Temperature	°R
P _{std}	29.92	Standard Absolute Pressure	in. Hg
Q	72,493,203	Dry Volumetric Flow Rate Corrected to Standard Conditions	dsfc/hr
D _n	0.244	Nozzle Diameter	inches
A _n	3.25E-04	Cross-Sectional Area of the Nozzle	ft ²
m _n	10.60	Total PM Mass	mg
C _s	2.96E-07	Particulate Concentration	lb/dsfc
E _{lb/hr}	21.5	PM Mass Emission Rate	pounds per hour
F _c	1800	F-Factor from EPA Method 19	scf/mmBtu
E _{lb/mmBtu}	0.005	PM Mass Emission Rate	pounds per million Btu
E _{tons/yr}	94.0	PM Mass Emission Rate	tons per year
K5	0.0945	Constant	(in.Hg · min) / (°R · sec)
Θ	120	Sample Time	minutes
I	95.7 %	Isokinetic variation	percent

EPA Method 5: Determination of Particulate Matter Emissions (40 CFR Part 60, Appendix A-1)

$$A = \pi(D_s/24)^2$$

$$\pi(323.3/24)^2$$

$$= 570.08 \text{ ft}^2$$

$$P_g = P_{bar}/13.6$$

$$= -2.5/13.6$$

$$= -0.18 \text{ in. Hg}$$

$$M_d = 30.00 \text{ lb/lb-mole}$$

$$P_m = P_{bar} + (\Delta H/13.6)$$

$$= 23.48 + (1.8/13.6)$$

$$= 23.61 \text{ in. Hg}$$

$$T_m = 460 + t_m$$

$$= 460 + 57$$

$$= 517 \text{ R}$$

$$V_{wc(std)} = K_1 \times V_{lc}$$

$$= 0.04706 \times 221.1$$

$$= 10.40 \text{ scf} \quad (Eq. 4-1)$$

$$V_{m(std)} = \frac{K_4 \times Y \times V_m \times P_m}{T_m}$$

$$= \frac{17.64 \times 0.9988 \times 98.126 \times 23.61}{517}$$

$$= 78.96 \text{ dscf} \quad (Eq. 4-3)$$

$$B_{ws} = \frac{V_{wc(std)}}{V_{wc(std)} + V_{m(std)}}$$

$$= \frac{10.40}{10.40 + 78.96}$$

= 0.116 (%/100) (Eq. 4-4) [Observed value above saturation; calculated saturation value used for subsequent calculations.]

$$M_s = M_d \times (1 - B_{ws}) + (18.0 \times B_{ws})$$

$$= 30.00 \times (1 - 0.108) + (18.0 \times 0.108)$$

$$= 28.70 \text{ lb/lb-mole} \quad (Eq. 2-6)$$

$$P_s = P_{bar} + P_g$$

$$= 23.48 + (-0.18)$$

$$= 23.30 \text{ in. Hg}$$

$$T_{s(abs)} = 460 + T_s$$

$$= 460 + 109$$

$$= 569 \text{ R}$$

EPA Method 5: Determination of Particulate Matter Emissions (40 CFR Part 60, Appendix A-1)

$$V_s = \frac{K_p \times C_p \times Avgv/\Delta p}{\sqrt{\frac{T_{s(abs)}}{(P_s \times M_s)}}}$$

$$= 85.49 \times 0.84 \times 0.8276 \times \sqrt{\frac{569}{(23.30 \times 28.70)}}$$

$$= 54.8 \text{ ft/sec} \quad (Eq. 2-7)$$

$$Q = 3600 \times (1 - B_{ws}) \times (V_s) \times (A) \times \frac{(T_{std} \times P_s)}{(T_{s(abs)} \times P_{std})}$$

$$= 3600 \times (1 - 0.108) \times (54.83) \times (570.08) \times \frac{(528 \times 23.30)}{(569 \times 29.92)}$$

$$= 72,493,203 \text{ dscf/hr} \quad (Eq. 2-8)$$

$$A_n = \pi(D_n/24)^2$$

$$\pi(0.244/24)^2$$

$$= 3.25E-04 \text{ ft}^2$$

$$C_s = \frac{m_n}{(mg/g)(g/lb)(V_{m(std)})}$$

$$= \frac{10.6}{(1000)(453.592)(78.961)}$$

$$= 2.96E-07 \text{ lb/dscf}$$

$$E_{lb/hr} = C_s \times Q$$

$$= 2.96E-07 \times 72493203$$

$$= 21.5 \text{ lb/hr}$$

$$E_{lb/mmBtu} = \frac{C_s \times F_c \times 100}{(CO_2\%vd)}$$

$$= \frac{2.96E-07 \times 1800 \times 100}{(11.7)}$$

$$= 0.005 \text{ lb/mmBtu}$$

$$E_{tons/yr} = \frac{E_{lb/hr} \times (\text{Hrs/yr})}{(\text{lbs/ton})}$$

$$= \frac{21.45 \times 8,760}{2000}$$

$$= 94.0 \text{ tons/year}$$

$$I = \frac{K5 \times T_{s(abs)} \times V_{m(std)} \times 100}{P_{s(abs)} \times V_s \times A_n \times \Theta \times (1 - B_{ws})}$$

$$= \frac{0.0945 \times 569 \times 78.961 \times 100}{23.30 \times 54.83 \times 3.2E-04 \times 120 \times (1 - 0.108)}$$

$$= 95.7 \% \quad (Eq. 5-7)$$



Appendix B: Field Data

Field Datasheets

Emissions Measurement Company: Method 5/202 Data Sheet

EMCo Job #:	<u>043AS-341317</u>	Operator(s):	<u>GW</u>
Client:	<u>Pacificorp</u>	Barometric pressure ("Hg):	<u>23.48</u>
Source:	<u>HNTG 1</u>	Static pressure ("H ₂ O):	<u>-2.5</u>
Date:	<u>2/6/18</u>	Leak Check ("H ₂ O @ Vac):	<u>0.05 @ 15"</u>
Run #	<u>1</u>	Leak Check ("H ₂ O @ Vac):	<u>0.00 @ 16"</u>
Meterbox ID:	<u>MS-2</u>	Pitot ID / Coeff:	<u>.84</u>
Meterbox Y =	<u>.99854H@= 1.772</u>	Pitot Leak Check:	<u>✓</u>
O ₂ %:	<u>8.0</u>	Nozzle Diameter:	<u>.244</u>
CO ₂ %:	<u>10.3</u>	K Factor:	<u>2.67</u>
Start Time:	<u>0738</u>	Stop Time:	<u>0949</u>

Impinger Weights (x.x g)	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total		
	Total	

767.900

Traverse	Sample	Stack Temp	Probe Temp	Filter Temp	Velocity Δp	Orifice Pressure	Vacuum	Sample	DGM Temp (°F)	CPM Filter	Imp. Outlet
Point	Time	(°F)	(°F)	(°F)	("H ₂ O)	ΔH ("H ₂ O)	("Hg)	Volume (ft ³)	Inlet	Outlet	Temp (°F)
1 1	10	109	315	320	.64	1.7	9	775.8	52	50	68
2 20	109	317	320	320	.74	2.0	10	784.5	52	51	68
3 30	109	317	322	322	.77	2.1	11	793.2	55	52	69
2 1	40	109	322	322	.60	1.6	9	800.9	56	53	65
2 50	109	320	320	320	.71	1.9	11	809.2	59	54	65
3 60	109	320	321	321	.74	2.0	12	817.8	62	56	66
3 1	70	109	316	320	.60	1.6	10	825.4	61	57	68
2 80	109	320	320	320	.70	1.9	11	833.7	62	57	68
3 90	110	322	320	323	.73	1.9	11	842.1	64	58	71
4 1	100	110	316	320	.55	1.5	9	849.6	62	59	70
2 110	110	317	320	320	.73	1.9	11	857.8	63	59	74
3 120	110	315	320	320	.73	1.9	11	866.026	65	59	76
12	120	109	315	320	• 8276	1.8	12	98.126	57	69	59
Total	Total	Average	Minimum	Minimum	Avg Δp	Average	Max.	Total	Average	Average	Maximum

Emissions Measurement Company: Method 5/202 Data Sheet

EMCo Job #: 043AS-341317	Operator(s): CW
Client: Pacificorp	Barometric pressure ("Hg): 23.48
Source: HWTG 1	Static pressure ("H ₂ O): -2.5
Date: 2/6/18	Leak Check ("H ₂ O @ Vac): 0.00 @ 16"
Run # 2	Leak Check ("H ₂ O @ Vac): 0.00 @ 16"
Meterbox ID: MS-2	Pitot ID / Coeff: .84
Meterbox Y = .9988 ft @ 1.772	Pitot Leak Check: ✓
O ₂ %: 8.0	Nozzle Diameter: .244
CO ₂ %: 10.3	K Factor: 2.74
Start Time 1020	Stop Time 12:31

Impinger Weights (x.x g)	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total		
		Total

866-360

Traverse Point	Sample Time	Stack Temp (°F)	Probe Temp (°F)	Filter Temp (°F)	Velocity Δp ("H ₂ O)	Orifice Pressure ΔH ("H ₂ O)	Vacuum ("Hg)	Sample Volume (ft ³)	DGM Temp (°F) Inlet	CPM Filter Temp (°F) Outlet	Imp. Outlet Temp (°F)
1 1	10	109	316	318	.56	1.5	9	873.7	60	59	69 52
2 20	109	318	320	320	.69	1.9	11	882.0	63	59	68 48
3 30	109	320	318	318	.73	2.0	12	890.2	64	59	69 50
2 1	40	110	319	323	.59	1.6	9	897.9	62	59	69 52
2 50	109	320	318	318	.71	1.9	10	906.2	65	59	68 53
3 60	109	320	322	322	.78	2.1	12	914.8	67	60	66 54
3 1	70	109	318	320	.60	1.6	10	922.6	68	60	67 57
2 80	110	320	320	320	.70	1.9	11	930.8	68	61	70 59
3 90	109	321	320	320	.75	2.1	12	939.5	68	61	70 59
4 1	100	110	322	319	.55	1.58	9	947.1	67	62	69 60
2 110	110	320	325	325	.69	1.9	11	955.4	68	62	68 57
3 120	110	320	322	322	.74	2.0	11	963.949	69	62	71 59
12	120	(109)	316	318	(.8198)	(1.8)	12	97.589	(63)	(69)	(60)
Total	Total	Average	Minimum	Minimum	Avg Δp	Average	Max.	Total	Average	Average	Maximum

Emissions Measurement Company: Method 5/202 Data Sheet

EMCo Job #:	043AS-341317	Operator(s):	CW
Client:	Pacificorp	Barometric pressure ("Hg):	23.48
Source:	HNTCR 1	Static pressure ("H ₂ O):	-2.5
Date:	2/6/18	Leak Check ("H ₂ O @ Vac):	0.00 @ 15"
Run #	3	Leak Check ("H ₂ O @ Vac):	0.00 @ 16"
Meterbox ID:	M5-2	Pitot ID / Coeff:	.84
Meterbox Y =	.9988 ΔH@= 1.772	Pitot Leak Check:	✓
O ₂ %:	8.0	Nozzle Diameter:	.244
CO ₂ %:	10.3	K Factor:	2.76
Start Time	1303	Stop Time	1514

Impinger Weights (x.x g)	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total		
	Total	

964.175

Traverse Point	Sample Time	Stack Temp (°F)	Probe Temp (°F)	Filter Temp (°F)	Velocity Δp (in H ₂ O)	Orifice Pressure ΔH (in H ₂ O)	Vacuum (in Hg)	Sample Volume (ft ³)	DGM Temp (°F) Inlet	CPM Filter Temp (°F) Outlet	Imp. Outlet Temp (°F)
1 1	10	110	315	320	.60	1.7	10	971.9	61	60	71 51
2 2	20	110	317	322	.72	2.0	11	980.2	63	60	66 48
3 3	30	110	319	321	.73	2.0	11	988.5	64	61	66 45
2 1	40	110	319	320	.56	1.5	8	995.9	63	61	65 41
2 2	50	110	321	320	.70	1.9	9	1004.1	67	61	67 43
3 3	60	110	319	320	.73	2.0	9	1012.7	70	62	68 45
3 1	70	110	320	321	.58	1.6	7	1020.3	71	62	70 48
2 2	80	110	320	320	.69	1.9	9	1028.8	71	63	73 49
3 3	90	110	320	320	.76	2.1	10	1037.5	72	64	72 48
4 1	100	110	316	317	.58	1.6	7	1045.1	70	64	71 49
2 2	110	110	318	319	.72	2.0	9	1053.7	71	64	73 45
3 3	120	110	320	323	.77	2.1	10	1062.512	72	64	74 46
12 12	120	110	315	317	.8224	1.9	11	1083.37	75	70	51
Total	Total	Average	Minimum	Minimum	Avg vΔp	Average	Max.	Total	Average	Average	Maximum

EMCO
EMISSIONS MEASUREMENT COMPANY

EPA Method 5/202 Moisture Datasheet

Job Code 043AS-341317
 Date 2/5/18
 Operator S.Bouchard U1

Run # 1

FILTER # 1434 TIN # 4743

Impinger	Tare Weight	Final Weight
Impinger 1	488.8	638.9
Impinger 2	442.0	449.3
Impinger 3	622.5	652.4
Impinger 4	934.9	968.7
Sum	2488.2	2769.3
Total Moisture Gain:		<u>221.1</u>

Run # 2

FILTER # 1432 TIN # 4747

Impinger	Tare Weight	Final Weight
Impinger 1	537.6	651.2
Impinger 2	648.7	675.7
Impinger 3	631.7	685.3
Impinger 4	912.7	945.1
Sum	2750.7	2957.3
Total Moisture Gain:		<u>206.6</u>

Run # 3

FILTER # 1337 TIN # 4825

Impinger	Tare Weight	Final Weight
Impinger 1	489.2	616.4
Impinger 2	444.0	452.0
Impinger 3	652.3	707.8
Impinger 4	912.9	942.3
Sum	2498.4	2718.5
Total Moisture Gain:		<u>220.1</u>



Appendix C: Lab Data

Gravimetric Analysis



EPA Method 5/202 Gravimetric Analysis Report

Project Code: 043AS-341317
Date Finalized: 2/14/2018
Analyst: Brian Stockham

Laboratory Results Summary	
Sample ID	Filterable Particulate Matter (mg)
Huntington Unit 1, Run #1	10.6
Huntington Unit 1, Run #2	7.1
Huntington Unit 1, Run #3	10.2

No acetone blank corrections were performed.

Analytical Narrative

Quartz fiber filters were dessicated and tared to a constant weight in the MAQS laboratory prior to sampling. Following testing, the filters were dessicated for at least 24 hours, then weighed to a constant weight (± 0.5 mg). The acetone rinses were measured to the nearest milliliter, transferred to tared aluminum weighing dishes, taken to dryness under a fume hood, dessicated for at least 24 hours, then weighed to a constant weight (± 0.5 mg). Each result above represents total filterable particulate matter for each test run (acetone rinse + filter catch), with no blank correction performed unless otherwise indicated.

Instrumentation

All measurements were taken using a Torbal Model AGCN200 Analytical Balance under laboratory conditions. The instrument is auto-calibrated and challenged with three NIST-traceable reference weights daily.

Detection Limit / Sensitivity

All measurements are recorded to 0.0001g (0.1mg).

Notes

No deviations from the analytical procedures from EPA Method 5 were noted. All samples were received in good condition. After analysis, all samples are archived for a period of one year.

Attachments

Gravimetric Analysis Logs

Sample Chain of Custody



EPA Method 5 Gravimetric Analysis Log

Project Code: 043AS-341317
Unit ID: Huntington Unit 1

Front-Half Particulate Matter Filter Catch

Filter #	Run #1		Run #2		Run #3	
	Date	Weight (g)	Date	Weight (g)	Date	Weight (g)
Final Weight #1 (g)	2/12/18	0.3847	2/12/18	0.3858	2/12/18	0.3828
Final Weight #2 (g)	2/13/18	0.3851	2/13/18	0.3860	2/13/18	0.3829
Tare Weight #1 (g)	6/29/17	0.3783	6/29/17	0.3792	4/4/17	0.3755
Tare Weight #2 (g)	6/30/17	0.3786	6/30/17	0.379	4/5/17	0.3759
Filter Catch (g)	0.0064		0.0068		0.0072	

Front-Half Particulate Matter Acetone Rinse Catch

Dish #	Run #1		Run #2		Run #3	
	Date	Weight (g)	Date	Weight (g)	Date	Weight (g)
Final Weight #1 (g)	2/12/18	6.5576	2/12/18	6.3296	2/12/18	6.3939
Final Weight #2 (g)	2/13/18	6.5577	2/13/18	6.3301	2/13/18	6.3942
Tare Weight #1 (g)	12/11/17	6.5536	12/11/17	6.3296	12/11/17	6.3910
Tare Weight #2 (g)	1/2/18	6.5534	1/2/18	6.3296	1/2/18	6.3911
Rinse Catch (g)	0.0042		0.0003		0.0030	

Total Particulate Catch

	Run #1	Run #2	Run #3
Filter Catch (g)	0.0064	0.0068	0.0072
+ Rinse Catch (g)	0.0042	0.0003	0.0030
- Acetone Blank (g)	0.0000	0.0000	0.0000
Total PM (g)	0.0106	0.0071	0.0102



Appendix D: CEMS Data

CEMS Printouts for Test Runs

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 07:38 Through 02/06/2018 09:49

Time Online Criteria: 1 minute(s)

Source	Parameter Unit	UNIT1				
		BARPRESS (/INHG)	CO2 (/PCT)	OPACITY (/PCT)	STKTEMP (/DEGF)	UNITLOAD (/MMW)
02/06/18	07:38	23.636	10.3	0.7	103.72	482
02/06/18	07:39	23.636	10.2	0.7	103.97	481
02/06/18	07:40	23.635	10.2	0.7	104.18	480
02/06/18	07:41	23.634	10.2	0.7	104.26	479
02/06/18	07:42	23.635	10.3	0.8	103.91	480
02/06/18	07:43	23.637	10.3	0.7	103.86	480
02/06/18	07:44	23.639	10.3	0.7	103.74	481
02/06/18	07:45	23.639	10.4	0.8	103.36	482
02/06/18	07:46	23.638	10.4	0.8	103.51	483
02/06/18	07:47	23.637	10.4	0.8	103.59	485
02/06/18	07:48	23.639	10.3	0.8	103.57	485
02/06/18	07:49	23.637	10.3	0.8	103.31	485
02/06/18	07:50	23.637	10.4	0.8	103.10	485
02/06/18	07:51	23.638	10.4	0.7	103.39	485
02/06/18	07:52	23.637	10.4	0.8	103.86	485
02/06/18	07:53	23.634	10.3	0.8	103.59	485
02/06/18	07:54	23.634	10.3	0.7	103.32	484
02/06/18	07:55	23.634	10.3	0.7	103.59	484
02/06/18	07:56	23.636	10.3	0.8	103.42	483
02/06/18	07:57	23.637	10.3	0.8	103.37	483
02/06/18	07:58	23.635	10.4	0.8	103.50	483
02/06/18	07:59	23.635	10.4	0.8	103.31	484
02/06/18	08:00	23.637	10.4	0.7	103.24	484
02/06/18	08:01	23.637	5.9 I	0.8	103.26	483
02/06/18	08:02	23.638	7.9 I	0.7	103.43	483
02/06/18	08:03	23.639	10.2 I	0.8	103.42	482
02/06/18	08:04	23.639	10.3 I	0.7	102.91	482
02/06/18	08:05	23.641	10.3	0.7	103.00	481
02/06/18	08:06	23.641	10.3	0.7	102.85	482
02/06/18	08:07	23.639	10.3	0.7	102.42	482
02/06/18	08:08	23.639	10.3	0.7	102.65	483
02/06/18	08:09	23.639	10.3	0.7	103.10	483
02/06/18	08:10	23.639	10.4	0.7	103.10	485
02/06/18	08:11	23.640	10.4	0.7	103.17	484
02/06/18	08:12	23.640	10.3	0.7	103.25	483
02/06/18	08:13	23.639	10.3	0.7	102.84	483
02/06/18	08:14	23.639	10.3	0.7	102.10	482
02/06/18	08:15	23.639	10.3	0.7	102.10	482
02/06/18	08:16	23.639	10.3	0.7	102.20	482

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

C = Calibration

S = Substituted

* = Suspect

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 07:38 Through 02/06/2018 09:49

Time Online Criteria: 1 minute(s)

02/06/18	08:17	23.639	10.3	0.7	101.88	482
02/06/18	08:18	23.639	10.3	0.7	101.63	482
02/06/18	08:19	23.639	10.3	0.7	101.73	482
02/06/18	08:20	23.639	10.3	0.7	101.74	483
02/06/18	08:21	23.639	10.4	0.7	101.28	484
02/06/18	08:22	23.639	10.5	0.7	101.05	484
02/06/18	08:23	23.639	10.4	0.7	100.99	485
02/06/18	08:24	23.640	10.4	0.7	100.60	485
02/06/18	08:25	23.641	10.4	0.6	100.58	484
02/06/18	08:26	23.642	10.4	0.6	101.44	484
02/06/18	08:27	23.643	10.4	0.7	101.82	483
02/06/18	08:28	23.643	10.4	0.7	101.63	483
02/06/18	08:29	23.643	10.4	0.7	101.77	483
02/06/18	08:30	23.643	10.4	0.7	101.21	484
02/06/18	08:31	23.644	10.5	0.7	100.72	485
02/06/18	08:32	23.644	10.4	0.7	100.97	485
02/06/18	08:33	23.643	10.5	0.7	101.36	484
02/06/18	08:34	23.644	10.4	0.7	101.72	483
02/06/18	08:35	23.645	10.3	0.6	102.51	482
02/06/18	08:36	23.644	10.3	0.7	102.72	481
02/06/18	08:37	23.644	10.2	0.7	102.30	481
02/06/18	08:38	23.645	10.3	0.7	101.98	481
02/06/18	08:39	23.646	10.4	0.7	101.44	482
02/06/18	08:40	23.646	10.3	0.7	101.08	482
02/06/18	08:41	23.646	10.3	0.7	100.83	482
02/06/18	08:42	23.646	10.3	0.7	100.97	481
02/06/18	08:43	23.647	10.4	0.7	100.95	481
02/06/18	08:44	23.648	10.4	0.7	101.26	481
02/06/18	08:45	23.647	10.3	0.7	101.22	480
02/06/18	08:46	23.649	10.3	0.7	101.27	480
02/06/18	08:47	23.650	10.4	0.7	101.14	480
02/06/18	08:48	23.651	10.5	0.7	100.55	482
02/06/18	08:49	23.653	10.5	0.7	100.10	483
02/06/18	08:50	23.652	10.5	0.7	100.34	484
02/06/18	08:51	23.652	10.5	0.7	100.36	485
02/06/18	08:52	23.654	10.5	0.7	99.82	486
02/06/18	08:53	23.654	10.4	0.7	100.99	485
02/06/18	08:54	23.653	10.4	0.7	102.04	484
02/06/18	08:55	23.655	10.4	0.7	101.83	483
02/06/18	08:56	23.655	10.4	0.7	101.62	482
02/06/18	08:57	23.654	10.3	0.7	102.23	481
02/06/18	08:58	23.654	10.2	0.7	102.77	479

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

C = Calibration

S = Substituted

* = Suspect

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 07:38 Through 02/06/2018 09:49

Time Online Criteria: 1 minute(s)

02/06/18	08:59	23.655	10.3	0.7	102.75	479
02/06/18	09:00	23.656	10.2	0.7	102.52	478
02/06/18	09:01	23.656	10.3	0.7	103.40	478
02/06/18	09:02	23.656	10.3	0.7	102.05	479
02/06/18	09:03	23.655	10.5	0.7	101.65	481
02/06/18	09:04	23.655	10.5	0.7	101.57	482
02/06/18	09:05	23.656	10.5	0.7	101.35	484
02/06/18	09:06	23.657	10.4	0.7	101.65	484
02/06/18	09:07	23.657	10.3	0.7	102.09	483
02/06/18	09:08	23.658	10.3	0.7	102.75	482
02/06/18	09:09	23.658	10.3	0.7	103.05	480
02/06/18	09:10	23.658	10.3	0.8	103.00	478
02/06/18	09:11	23.659	10.3	0.8	102.95	478
02/06/18	09:12	23.660	10.4	0.7	102.62	478
02/06/18	09:13	23.661	10.4	0.8	102.51	480
02/06/18	09:14	23.663	10.4	0.8	101.94	481
02/06/18	09:15	23.664	10.5	0.7	101.74	484
02/06/18	09:16	23.665	10.5	0.7	102.21	485
02/06/18	09:17	23.665	10.4	0.7	102.64	485
02/06/18	09:18	23.667	10.4	0.7	102.78	484
02/06/18	09:19	23.668	10.4	0.7	103.07	483
02/06/18	09:20	23.669	10.4	0.7	103.57	482
02/06/18	09:21	23.670	10.4	0.7	103.77	481
02/06/18	09:22	23.671	10.3	0.7	103.46	481
02/06/18	09:23	23.672	10.3	0.7	103.15	481
02/06/18	09:24	23.671	10.4	0.7	102.65	482
02/06/18	09:25	23.672	10.5	0.7	102.07	483
02/06/18	09:26	23.672	10.5	0.7	102.18	484
02/06/18	09:27	23.672	10.4	0.7	102.49	485
02/06/18	09:28	23.671	10.5	0.7	102.49	485
02/06/18	09:29	23.670	10.4	0.7	102.50	484
02/06/18	09:30	23.670	10.3	0.7	102.56	483
02/06/18	09:31	23.671	10.3	0.7	102.65	481
02/06/18	09:32	23.672	10.3	0.8	102.63	480
02/06/18	09:33	23.673	10.4	0.7	102.83	480
02/06/18	09:34	23.673	10.4	0.7	103.51	481
02/06/18	09:35	23.673	10.4	0.7	103.17	481
02/06/18	09:36	23.673	10.4	0.7	103.08	482
02/06/18	09:37	23.674	10.4	0.7	103.33	482
02/06/18	09:38	23.674	10.3	0.7	103.02	482
02/06/18	09:39	23.674	10.4	0.7	102.33	481
02/06/18	09:40	23.674	10.4	0.7	102.38	481

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

C = Calibration

S = Substituted

* = Suspect

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 07:38 Through 02/06/2018 09:49

Time Online Criteria: 1 minute(s)

02/06/18	09:41	23.675	10.3	0.7	102.76	480
02/06/18	09:42	23.676	10.3	0.7	103.00	480
02/06/18	09:43	23.676	10.3	0.7	102.86	481
02/06/18	09:44	23.675	10.4	0.8	102.49	480
02/06/18	09:45	23.676	10.5	0.7	102.28	482
02/06/18	09:46	23.677	10.3	0.7	102.21	482
02/06/18	09:47	23.677	10.3	0.7	102.45	481
02/06/18	09:48	23.678	10.3	0.7	102.50	480
02/06/18	09:49	23.678	10.3	0.7	102.30	481

Average 23.652 10.4 0.7 102.41 482

Minimum 23.634 10.2 0.6 99.82 478

Maximum 23.678 10.5 0.8 104.26 486

Summation 3,122.044 1,326.2 94.2 13,517.87 63,658

Geometric Mean

Included Data Points 132 128 132 132 132

Total number of Data Points 132 132 132 132 132

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

Report Generated 02/06/18 09:53
045AS-341317-PP-11

C = Calibration

S = Substituted

*** = Suspect**

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 10:20 Through 02/06/2018 12:31

Time Online Criteria: 1 minute(s)

Source	Parameter	UNIT1				
		BARPRESS (INHG)	CO2 (PCT)	OPACITY (PCT)	STKTEMP (DEGF)	UNITLOAD (MMW)
02/06/18	10:20	23.695	10.4	0.7	103.19	480
02/06/18	10:21	23.695	10.4	0.7	103.70	480
02/06/18	10:22	23.696	10.4	0.7	103.36	481
02/06/18	10:23	23.697	10.4	0.7	102.93	479
02/06/18	10:24	23.699	10.4	0.7	102.62	479
02/06/18	10:25	23.701	10.5	0.7	102.57	480
02/06/18	10:26	23.701	10.5	0.7	102.76	481
02/06/18	10:27	23.703	10.5	0.7	102.96	481
02/06/18	10:28	23.703	10.5	0.7	102.66	482
02/06/18	10:29	23.704	10.4	0.7	102.11	483
02/06/18	10:30	23.704	10.5	0.7	101.76	484
02/06/18	10:31	23.705	10.6	0.7	101.48	485
02/06/18	10:32	23.706	10.5	0.7	101.95	486
02/06/18	10:33	23.705	10.4	0.7	102.60	485
02/06/18	10:34	23.705	10.4	0.7	102.59	484
02/06/18	10:35	23.705	10.4	0.7	102.73	483
02/06/18	10:36	23.706	10.4	0.7	102.70	481
02/06/18	10:37	23.707	10.4	0.7	102.35	482
02/06/18	10:38	23.708	10.5	0.7	102.41	482
02/06/18	10:39	23.709	10.4	0.7	102.15	482
02/06/18	10:40	23.709	10.4	0.7	102.16	482
02/06/18	10:41	23.709	10.4	0.7	101.96	483
02/06/18	10:42	23.710	10.5	0.7	101.75	483
02/06/18	10:43	23.710	10.5	0.7	102.17	484
02/06/18	10:44	23.710	10.5	0.7	102.51	485
02/06/18	10:45	23.711	10.5	0.7	102.14	483
02/06/18	10:46	23.711	10.5	0.7	102.24	483
02/06/18	10:47	23.711	10.5	0.7	102.05	483
02/06/18	10:48	23.710	10.5	0.7	101.95	484
02/06/18	10:49	23.711	10.5	0.7	102.27	484
02/06/18	10:50	23.711	10.4	0.7	102.46	486
02/06/18	10:51	23.711	10.4	0.7	102.37	486
02/06/18	10:52	23.708	10.5	0.7	102.61	486
02/06/18	10:53	23.708	10.5	0.7	102.41	486
02/06/18	10:54	23.708	10.5	0.7	102.31	487
02/06/18	10:55	23.710	10.6	0.7	102.13	488
02/06/18	10:56	23.711	10.6	0.7	102.44	489
02/06/18	10:57	23.712	10.4	0.7	102.45	488
02/06/18	10:58	23.713	10.5	0.7	102.16	488

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

C = Calibration

S = Substituted

* = Suspect

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 10:20 Through 02/06/2018 12:31

Time Online Criteria: 1 minute(s)

02/06/18	10:59	23.714	10.5	0.7	102.25	487
02/06/18	11:00	23.714	10.4	0.7	102.68	485
02/06/18	11:01	23.714	10.3	0.7	103.39	483
02/06/18	11:02	23.713	10.2	0.7	104.25	483
02/06/18	11:03	23.713	10.2	0.7	104.16	481
02/06/18	11:04	23.714	10.3	0.7	103.40	481
02/06/18	11:05	23.715	10.3	0.7	103.05	481
02/06/18	11:06	23.715	10.4	0.8	102.53	481
02/06/18	11:07	23.715	10.4	0.7	102.00	481
02/06/18	11:08	23.717	10.4	0.7	102.03	482
02/06/18	11:09	23.717	10.5	0.7	101.98	482
02/06/18	11:10	23.717	10.4	0.7	101.53	483
02/06/18	11:11	23.717	10.5	0.7	101.69	483
02/06/18	11:12	23.716	10.4	0.8	102.39	484
02/06/18	11:13	23.715	10.5	0.7	101.93	486
02/06/18	11:14	23.715	10.6	0.7	101.38	487
02/06/18	11:15	23.716	10.5	0.7	102.21	488
02/06/18	11:16	23.718	10.4	0.7	102.93	488
02/06/18	11:17	23.716	10.4	0.7	104.02	488
02/06/18	11:18	23.715	10.4	0.7	103.72	485
02/06/18	11:19	23.717	10.3	0.7	103.66	483
02/06/18	11:20	23.718	10.2	0.7	103.08	482
02/06/18	11:21	23.717	10.3	0.7	102.70	480
02/06/18	11:22	23.718	10.4	0.7	102.59	480
02/06/18	11:23	23.718	10.4	0.7	102.56	480
02/06/18	11:24	23.719	10.4	0.7	102.61	480
02/06/18	11:25	23.719	10.3	0.8	103.29	480
02/06/18	11:26	23.719	10.4	0.7	103.05	480
02/06/18	11:27	23.721	10.4	0.7	102.91	480
02/06/18	11:28	23.723	10.3	0.7	102.68	480
02/06/18	11:29	23.722	10.3	0.7	102.76	479
02/06/18	11:30	23.720	10.4	0.7	102.62	480
02/06/18	11:31	23.721	10.4	0.7	102.45	481
02/06/18	11:32	23.721	10.4	0.7	102.49	481
02/06/18	11:33	23.719	10.4	0.7	101.90	482
02/06/18	11:34	23.718	10.5	0.7	101.73	482
02/06/18	11:35	23.718	10.4	0.7	102.42	481
02/06/18	11:36	23.718	10.4	0.7	102.32	482
02/06/18	11:37	23.720	10.6	0.7	101.72	483
02/06/18	11:38	23.722	10.5	0.7	101.56	484
02/06/18	11:39	23.722	10.6	0.7	101.47	485
02/06/18	11:40	23.722	10.6	0.7	101.83	485

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

C = Calibration

S = Substituted

* = Suspect

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 10:20 Through 02/06/2018 12:31

Time Online Criteria: 1 minute(s)

02/06/18	11:41	23.722	10.4	0.7	102.65	484
02/06/18	11:42	23.720	10.3	0.7	102.93	484
02/06/18	11:43	23.723	10.4	0.7	102.68	483
02/06/18	11:44	23.723	10.5	0.7	102.93	483
02/06/18	11:45	23.723	10.4	0.7	103.21	482
02/06/18	11:46	23.722	10.4	0.7	103.20	482
02/06/18	11:47	23.722	10.4	0.7	102.63	483
02/06/18	11:48	23.723	10.5	0.7	101.92	483
02/06/18	11:49	23.722	10.6	0.7	102.08	485
02/06/18	11:50	23.721	10.6	0.7	102.26	487
02/06/18	11:51	23.722	10.6	0.8	102.03	487
02/06/18	11:52	23.723	10.5	0.7	102.47	488
02/06/18	11:53	23.722	10.6	0.7	103.39	487
02/06/18	11:54	23.723	10.5	0.7	104.41	485
02/06/18	11:55	23.722	10.4	0.7	104.96	483
02/06/18	11:56	23.720	10.3	0.7	105.51	481
02/06/18	11:57	23.720	10.3	0.7	105.82	480
02/06/18	11:58	23.721	10.3	0.7	105.44	481
02/06/18	11:59	23.721	10.4	0.8	104.76	482
02/06/18	12:00	23.722	10.4	0.7	104.44	483
02/06/18	12:01	23.723	6.0 I	0.7	104.56	483
02/06/18	12:02	23.723	8.2 I	0.7	104.69	484
02/06/18	12:03	23.722	10.4 I	0.7	104.98	483
02/06/18	12:04	23.722	10.2 I	0.7	104.89	482
02/06/18	12:05	23.723	10.3	0.7	104.94	482
02/06/18	12:06	23.723	10.3	0.7	105.46	481
02/06/18	12:07	23.722	10.4	0.7	105.23	481
02/06/18	12:08	23.722	10.4	0.7	104.76	481
02/06/18	12:09	23.721	10.4	0.7	104.34	481
02/06/18	12:10	23.722	10.4	0.8	104.17	482
02/06/18	12:11	23.724	10.5	0.7	103.52	483
02/06/18	12:12	23.723	10.6	0.7	103.38	484
02/06/18	12:13	23.725	10.5	0.7	104.05	485
02/06/18	12:14	23.726	10.5	0.7	104.25	485
02/06/18	12:15	23.725	10.5	0.7	104.15	485
02/06/18	12:16	23.725	10.4	0.7	104.46	484
02/06/18	12:17	23.725	10.4	0.7	104.64	483
02/06/18	12:18	23.726	10.5	0.7	104.11	483
02/06/18	12:19	23.726	10.4	0.7	103.62	482
02/06/18	12:20	23.727	10.4	0.7	103.40	483
02/06/18	12:21	23.727	10.5	0.7	103.20	484
02/06/18	12:22	23.725	10.5	0.7	103.20	484

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

C = Calibration

S = Substituted

* = Suspect

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 10:20 Through 02/06/2018 12:31

Time Online Criteria: 1 minute(s)

02/06/18	12:23	23.727	10.5	0.7	103.78	483
02/06/18	12:24	23.727	10.4	0.7	104.09	482
02/06/18	12:25	23.726	10.4	0.7	103.74	482
02/06/18	12:26	23.726	10.5	0.7	103.61	482
02/06/18	12:27	23.726	10.5	0.7	103.74	482
02/06/18	12:28	23.728	10.5	0.7	103.51	482
02/06/18	12:29	23.728	10.5	0.7	103.39	483
02/06/18	12:30	23.729	10.5	0.7	104.14	482
02/06/18	12:31	23.727	10.4	0.7	104.66	482

Average	23.717	10.4	0.7	103.03	483
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Minimum	23.695	10.2	0.7	101.38	479
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Maximum	23.729	10.6	0.8	105.82	489
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Summation	3,130.594	1,335.9	93.0	13,600.42	63,765
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Geometric Mean

Included Data Points	132	128	132	132	132
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Total number of Data Points	132	132	132	132	132
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F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

Report Generated 02/06/18 12:39
045AS-341317-PP-11

C = Calibration

S = Substituted

*** = Suspect**

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 13:03 Through 02/06/2018 15:14

Time Online Criteria: 1 minute(s)

Source	Parameter Unit	UNIT1				
		BARPRESS (/INHG)	CO2 (/PCT)	OPACITY (/PCT)	STKTEMP (/DEGF)	UNITLOAD (/MMW)
02/06/18	13:03	23.722	10.3	0.7	105.82	482
02/06/18	13:04	23.722	10.4	0.7	104.77	483
02/06/18	13:05	23.722	10.5	0.7	104.20	483
02/06/18	13:06	23.722	10.6	0.7	103.75	484
02/06/18	13:07	23.722	10.4	0.7	103.71	483
02/06/18	13:08	23.723	10.4	0.7	103.66	484
02/06/18	13:09	23.722	10.5	0.7	103.32	483
02/06/18	13:10	23.722	10.5	0.7	103.56	483
02/06/18	13:11	23.722	10.5	0.7	103.48	483
02/06/18	13:12	23.722	10.5	0.7	103.12	483
02/06/18	13:13	23.722	10.5	0.7	103.34	484
02/06/18	13:14	23.721	10.4	0.7	103.60	483
02/06/18	13:15	23.723	10.4	0.7	103.28	482
02/06/18	13:16	23.724	10.5	0.7	103.73	483
02/06/18	13:17	23.724	10.4	0.7	104.57	483
02/06/18	13:18	23.723	10.4	0.7	104.21	483
02/06/18	13:19	23.724	10.6	0.7	103.73	483
02/06/18	13:20	23.725	10.6	0.7	104.31	483
02/06/18	13:21	23.724	10.4	0.7	105.20	483
02/06/18	13:22	23.725	10.5	0.7	104.82	483
02/06/18	13:23	23.724	10.5	0.7	104.31	483
02/06/18	13:24	23.722	10.5	0.7	104.28	484
02/06/18	13:25	23.723	10.5	0.7	104.41	484
02/06/18	13:26	23.723	10.4	0.7	104.53	484
02/06/18	13:27	23.723	10.5	0.7	104.36	483
02/06/18	13:28	23.723	10.4	0.7	104.02	483
02/06/18	13:29	23.723	10.4	0.7	104.15	483
02/06/18	13:30	23.723	10.4	0.7	104.72	482
02/06/18	13:31	23.721	10.4	0.7	104.84	481
02/06/18	13:32	23.722	10.4	0.7	104.24	481
02/06/18	13:33	23.721	10.5	0.7	104.33	481
02/06/18	13:34	23.721	10.4	0.7	104.82	481
02/06/18	13:35	23.720	10.4	0.7	104.92	482
02/06/18	13:36	23.722	10.5	0.7	104.20	482
02/06/18	13:37	23.723	10.5	0.7	103.65	483
02/06/18	13:38	23.723	10.5	0.7	104.44	483
02/06/18	13:39	23.724	10.4	0.7	105.06	484
02/06/18	13:40	23.723	10.5	0.7	104.96	483
02/06/18	13:41	23.723	10.6	0.7	104.47	484

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

C = Calibration

S = Substituted

* = Suspect

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 13:03 Through 02/06/2018 15:14

Time Online Criteria: 1 minute(s)

02/06/18	13:42	23.717	10.6	0.7	103.98	484
02/06/18	13:43	23.718	10.6	0.7	104.19	484
02/06/18	13:44	23.721	10.5	0.7	104.68	486
02/06/18	13:45	23.720	10.5	0.7	104.85	487
02/06/18	13:46	23.719	10.5	0.7	104.77	487
02/06/18	13:47	23.719	10.5	0.7	104.72	487
02/06/18	13:48	23.721	10.5	0.7	105.13	486
02/06/18	13:49	23.721	10.4	0.7	105.30	485
02/06/18	13:50	23.722	10.4	0.7	104.78	483
02/06/18	13:51	23.723	10.4	0.7	103.95	482
02/06/18	13:52	23.723	10.5	0.7	104.03	483
02/06/18	13:53	23.724	10.4	0.7	104.66	483
02/06/18	13:54	23.724	10.4	0.7	104.45	483
02/06/18	13:55	23.723	10.5	0.7	104.06	483
02/06/18	13:56	23.721	10.5	0.7	104.66	483
02/06/18	13:57	23.720	10.3	0.7	105.01	483
02/06/18	13:58	23.719	10.3	0.7	105.08	483
02/06/18	13:59	23.719	10.4	0.6	104.69	482
02/06/18	14:00	23.721	10.4	0.7	104.24	482
02/06/18	14:01	23.721	10.3	0.7	104.34	482
02/06/18	14:02	23.722	10.4	0.7	104.20	481
02/06/18	14:03	23.721	10.4	0.7	103.97	481
02/06/18	14:04	23.721	10.4	0.7	103.97	482
02/06/18	14:05	23.722	10.4	0.7	103.96	482
02/06/18	14:06	23.720	10.5	0.7	103.81	484
02/06/18	14:07	23.720	10.5	0.7	104.22	484
02/06/18	14:08	23.721	10.5	0.7	104.70	483
02/06/18	14:09	23.721	10.3	0.7	104.20	484
02/06/18	14:10	23.722	10.4	0.7	103.61	483
02/06/18	14:11	23.721	10.4	0.7	103.13	483
02/06/18	14:12	23.720	10.5	0.7	102.91	483
02/06/18	14:13	23.722	10.5	0.7	103.47	483
02/06/18	14:14	23.722	10.4	0.7	103.98	483
02/06/18	14:15	23.721	10.4	0.7	103.97	483
02/06/18	14:16	23.722	10.5	0.7	103.95	483
02/06/18	14:17	23.722	10.4	0.7	104.07	482
02/06/18	14:18	23.723	10.3	0.7	104.28	482
02/06/18	14:19	23.727	10.3	0.7	104.32	482
02/06/18	14:20	23.725	10.4	0.7	103.98	482
02/06/18	14:21	23.725	10.4	0.7	104.09	482
02/06/18	14:22	23.725	10.3	0.7	104.62	482
02/06/18	14:23	23.724	10.4	0.7	104.82	482

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

C = Calibration

S = Substituted

* = Suspect

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 13:03 Through 02/06/2018 15:14

Time Online Criteria: 1 minute(s)

02/06/18	14:24	23.724	10.4	0.7	103.84	482
02/06/18	14:25	23.722	10.5	0.7	103.27	483
02/06/18	14:26	23.722	10.5	0.7	103.39	483
02/06/18	14:27	23.723	10.4	0.7	103.10	484
02/06/18	14:28	23.723	10.5	0.7	102.55	484
02/06/18	14:29	23.723	10.6	0.7	102.51	486
02/06/18	14:30	23.722	10.6	0.7	103.35	487
02/06/18	14:31	23.721	10.5	0.7	104.36	487
02/06/18	14:32	23.720	10.4	0.7	105.16	485
02/06/18	14:33	23.721	10.3	0.7	105.80	484
02/06/18	14:34	23.722	10.2	0.7	105.32	483
02/06/18	14:35	23.722	10.3	0.7	104.88	482
02/06/18	14:36	23.721	10.3	0.7	105.12	482
02/06/18	14:37	23.723	10.4	0.7	105.01	482
02/06/18	14:38	23.724	10.4	0.7	104.49	483
02/06/18	14:39	23.724	10.5	0.7	103.90	483
02/06/18	14:40	23.725	10.6	0.7	103.97	484
02/06/18	14:41	23.726	10.4	0.7	104.10	484
02/06/18	14:42	23.725	10.4	0.7	104.42	483
02/06/18	14:43	23.726	10.3	0.7	105.03	483
02/06/18	14:44	23.729	10.3	0.7	105.00	481
02/06/18	14:45	23.731	10.3	0.7	104.68	481
02/06/18	14:46	23.730	10.3	0.7	104.65	481
02/06/18	14:47	23.729	10.3	0.7	104.83	481
02/06/18	14:48	23.727	10.4	0.7	104.11	482
02/06/18	14:49	23.728	10.4	0.7	103.41	482
02/06/18	14:50	23.729	10.5	0.7	103.65	484
02/06/18	14:51	23.730	10.5	0.7	104.53	484
02/06/18	14:52	23.730	10.4	0.7	104.51	484
02/06/18	14:53	23.729	10.6	0.7	103.92	485
02/06/18	14:54	23.729	10.5	0.7	103.97	485
02/06/18	14:55	23.728	10.4	0.7	104.12	484
02/06/18	14:56	23.730	10.3	0.7	104.52	483
02/06/18	14:57	23.730	10.3	0.7	104.78	481
02/06/18	14:58	23.730	10.3	0.7	104.65	479
02/06/18	14:59	23.733	10.2	0.7	104.74	479
02/06/18	15:00	23.732	10.3	0.7	103.67	479
02/06/18	15:01	23.732	10.3	0.7	103.81	480
02/06/18	15:02	23.732	10.4	0.7	103.88	479
02/06/18	15:03	23.733	10.3	0.7	103.97	481
02/06/18	15:04	23.733	10.4	0.7	103.65	482
02/06/18	15:05	23.736	10.5	0.7	103.67	483

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

C = Calibration

S = Substituted

* = Suspect

Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 02/06/2018 13:03 Through 02/06/2018 15:14

Time Online Criteria: 1 minute(s)

02/06/18	15:06	23.738	10.5	0.7	103.92	483
02/06/18	15:07	23.738	10.5	0.7	104.66	484
02/06/18	15:08	23.737	10.4	0.7	104.96	484
02/06/18	15:09	23.737	10.4	0.7	104.33	483
02/06/18	15:10	23.738	10.4	0.7	103.82	483
02/06/18	15:11	23.737	10.4	0.7	104.08	482
02/06/18	15:12	23.738	10.3	0.7	104.54	482
02/06/18	15:13	23.740	10.4	0.7	104.85	482
02/06/18	15:14	23.741	10.4	0.7	104.51	483

Average 23.725 10.4 0.7 104.25 483

Minimum 23.717 10.2 0.6 102.51 479

Maximum 23.741 10.6 0.7 105.82 487

Summation 3,131.661 1,376.3 92.3 13,760.65 63,746

Geometric Mean

Included Data Points 132 132 132 132 132

Total number of Data Points 132 132 132 132 132

F = Unit Offline

E = Exceedance

M = Maintenance

T = Out Of Control

Report Generated 02/06/18 15:18
045AS-341317-PP-11

C = Calibration

S = Substituted

*** = Suspect**



Appendix E: Calibration Information

Dry Gas Meter Pre-Test and Post-Test Calibrations
Critical Orifice Calibration Certificate



METHOD 5 CRITICAL ORIFICE SET CALIBRATION

ORIFICE SET	40-73
ORIFICE SERIES	IS
METER GAMMA	0.5951

CALIBRATION CONDITIONS	
DATE STARTED	08/01/17
DATE FINISHED	08/01/17
CALIBRATION TECH	RS

CALIBRATION DATA												REFERENCE METER						RESULTS					
Date	Orifice Number	Barometric Pressure	Theoretical Critical Vacuum	Elapsed Time	Dew dH	Volume Initial	Volume Final	Volume Total	Standardized Volume	Outlet Temp	Outlet Temp	Ambient Temp	Ambient Temp	Ambient vacuum	Actual vacuum	Coefficient K	Coefficient K'	% Variation From Average	Standard Flow Q				
		mm Hg	mm Hg	'G	min	V _{m0}	V _{m1}	V _m	V _{s0}	t _{m0}	t _{m1}	t _{m0}	t _{m1}	t _m	t _{m0}	t _{m1}	t _m	<0.3%	Lpm				
08/01/17	40	734	355.9	mm Hg	0.0	m3	m3	m3	m3	°C	°C	°C	°C	in Hg	mmHg	see below ^a	see below ^b	%	Lpm				
08/01/17	40	734	355.9	mm Hg	0.0	25.6318	25.5906	0.0888	0.0839	26.7	26.7	25.6	25.6	607.0	1.3850E-04	0.2364	0.05	8.35	0.05				
08/01/17	40	734	355.9	mm Hg	0.0	25.5506	26.0393	0.0887	0.0838	26.7	26.7	25.6	25.6	607.0	1.3840E-04	0.2363	0.00	8.34	0.00				
08/01/17	48	734	355.9	mm Hg	0.0	26.0393	26.1280	0.0887	0.0837	26.7	26.7	25.6	25.6	607.0	1.3822E-04	0.2351	-0.06	8.34	-0.06				
08/01/17	48	734	355.9	mm Hg	0.0	25.6540	25.6844	0.1305	0.1231	27.2	26.7	25.6	25.6	581.0	2.287312	0.3470	-0.08	12.25	-0.08				
08/01/17	48	734	355.9	mm Hg	0.0	25.6844	25.7150	0.1305	0.1233	26.7	26.7	25.6	25.6	581.0	2.287312	0.3476	0.08	12.27	0.08				
08/01/17	48	734	355.9	mm Hg	0.0	25.7150	25.8455	0.1305	0.1232	26.7	26.7	25.6	25.6	581.0	2.28864E-04	0.3473	-0.01	12.26	-0.01				
08/01/17	55	734	355.9	mm Hg	0.0	24.8752	25.0520	0.1728	0.1629	27.2	26.7	25.6	25.6	581.0	2.28864E-04	0.3473	0.00	12.26	0.00				
08/01/17	55	734	355.9	mm Hg	0.0	25.6520	25.2251	0.1732	0.1632	27.2	27.2	25.0	25.0	554.0	2.8844E-04	0.3470	-0.10	16.22	-0.10				
08/01/17	55	734	355.9	mm Hg	0.0	25.2251	25.3980	0.1729	0.1630	27.2	27.2	25.0	25.0	554.0	2.8844E-04	0.3476	0.08	16.25	0.08				
08/01/17	63	734	355.9	mm Hg	0.0	24.4134	24.4339	0.2223	0.2100	26.7	26.7	25.0	25.0	554.0	3.8177E-04	0.4593	0.00	16.23	0.00				
08/01/17	63	734	355.9	mm Hg	0.0	24.4134	24.6339	0.2225	0.2099	26.7	27.2	25.0	25.0	552.0	3.8177E-04	0.4593	0.00	16.23	0.00				
08/01/17	63	734	355.9	mm Hg	0.0	24.6339	24.8585	0.2226	0.2098	27.2	27.2	25.0	25.0	552.0	3.8177E-04	0.4593	0.00	16.23	0.00				
08/01/17	73	734	355.9	mm Hg	0.0	23.2764	23.5701	0.2236	0.2186	25.6	25.6	25.0	25.0	484.0	4.9160E-04	0.5915	0.03	20.90	0.03				
08/01/17	73	734	355.9	mm Hg	0.0	23.5701	23.6647	0.2946	0.2900	25.6	26.1	25.0	25.0	484.0	4.9152E-04	0.5914	0.02	20.89	0.02				
08/01/17	73	734	355.9	mm Hg	0.0	23.8647	24.1591	0.2944	0.2882	26.1	26.7	25.0	25.0	484.0	4.9150E-04	0.5910	-0.05	20.89	-0.05				
08/01/17	73	734	355.9	mm Hg	0.0	24.1591	24.5487	0.2942	0.2880	26.7	27.2	25.0	25.0	484.0	4.9144E-04	0.5913	0.00	20.90	0.00				

^aFor valid test results, the Actual Vacuum must be 25mmHg greater than the Theoretical Critical Vacuum.

For valid test results, the Actual Vacuum must be 25mmHg greater than the Theoretical Critical Vacuum. The Critical Orifice Coefficient, K1 in Metric units, $(m^3/K^2) / (mmHg \cdot min)$

Approved By:  Client Project Manager

Date: 8/1/2017

ref.DGM-006

APEX INSTRUMENTS REFERENCE METER 2 Point Audit
USING WET-TEST METER #1AE6
Air Compliance Testing

Calibration Master Information	
WTM Model #	Al20
WTM Serial #	11AE6
WTM Gemma	0.9999
Original 16P Gemma	0.5951

Calibration Conditions			
Date	Time	12-Jan-17	1:30 in Hg
Barometric Pressure	29.85		
Calibration Tech	EW		

NIST Sealed Manometer

Q 440 1E4 400077

Fractional Conversions		
Std Temp	528	α_R
Std Press	29.92	In Hg
K_1	17.647	α_R in Ha

Calibration Data										Results			
Run Time	Metreting Console					Calibration Meter					Dry Gas Meter Calibration Factor	Water Pressure	Water Temperature
	Digital Input Elapsed (s)	Volume Initial (V_{in}) in H ₂ O	Volume Final (V_{in}) cubic feet	Volume Sample (V_{in}) cubic feet	Outlet Temp Initial (t_{in}) °F	Volume Initial (V_{in}) cubic feet	Volume Final (V_{in}) cubic feet	Outlet Temp Initial (t_{in}) °F	Outlet Temp Final (t_{in}) °F	Previous Current (γ)			
6.00	-3.9	435.192	441.194	6,002	73.4	672.645	678.575	5,930	70	70	2.2	0.9927	0.9985
10.00	-2.2	441.194	446.788	5,594	73.4	678.575	684.115	5,540	70	70	1.8	0.9953	0.8977

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 80, App A, Method 6, Paragraph 7.1.2.2, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards, NIST.

signature class white

Signature: John G. Miller

Date 1/12/17

PF-DGM-006

**APPENDIX INSTRUMENTS REFERENCE METER CALIBRATION
USING WET-TEST METER #1A6**

15-POINT ENGLISH UNITS

Calibration Meter Information			
WTM Model #	A1-20	Date	7-Feb-14
WTM Serial #	11AE6	Time	12:00
WTM Gamma	0.9999	Barometric Pressure	29.9 in Hg
Calibration Technician	EW	DGM Serial Number	S-120-1512377

Calibration Conditions							
Dry Gas Meter				Calibration Meter			
Elapsed Time	Meter Pressure	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Volume Initial	Volume Sample
(s)	(P _d) in H ₂ O	(V _d) cubic feet	(V _f) cubic feet	(T _d) °F	(T _f) °F	(V _c) cubic feet	(V _s) cubic feet
5	-5.0	212.428	6.140	73.4	79.120	85.150	6.030
5	-5.0	212.428	6.166	73.4	73.4	85.150	91.175
5	-5.0	218.594	6.183	73.4	75.2	91.175	6.025
6	-3.8	243.237	249.265	6.028	75.2	115.300	121.165
6	-3.8	249.265	255.316	6.051	75.2	121.165	127.045
6	-3.8	255.316	281.372	6.056	75.2	127.045	132.930
7	-2.9	261.372	287.016	5.644	75.2	132.930	138.420
7	-2.9	267.016	272.644	5.628	75.2	138.420	143.900
7	-2.9	272.644	278.281	5.637	75.2	143.900	149.390

Calibration Data							
Dry Gas Meter				Results			
Run Time	Elapsed Time	Meter Pressure	Volume Initial	Volume Final	Volume Initial	Volume Sample	Dry Gas Meter Calibration Factor
		(P _d) in H ₂ O	(V _d) cubic feet	(V _f) cubic feet	(V _c) cubic feet	(V _s) cubic feet	Std & Corr.
		mm	(V _d) cubic feet	(V _f) cubic feet	(V _c) cubic feet	(V _s) cubic feet	(V _c) cm ³
5	5	212.428	6.140	73.4	73.4	85.150	69
5	5	218.594	6.166	73.4	73.4	85.150	69
5	5	224.757	6.183	73.4	75.2	91.175	69
6	6	243.237	249.265	6.028	75.2	115.300	121.165
6	6	249.265	255.316	6.051	75.2	121.165	127.045
6	6	255.316	281.372	6.056	75.2	127.045	132.930
7	7	261.372	287.016	5.644	75.2	132.930	138.420
7	7	267.016	272.644	5.628	75.2	138.420	143.900
7	7	272.644	278.281	5.637	75.2	143.900	149.390
10	10	278.281	283.943	5.662	77.0	149.390	154.925
10	10	283.943	289.608	5.665	77.0	154.925	160.450
10	10	289.608	295.281	5.673	77.0	160.450	165.970
15	15	224.757	230.923	6.166	75.2	97.180	103.240
15	15	230.923	237.078	6.155	75.2	103.240	109.270
15	15	237.078	243.237	6.159	75.2	109.270	115.300

Note: For Calibration Factor F_d , the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the averages is ± 0.02 .

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AEB, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature

Date

2/7/14



American Association for Laboratory Accreditation

043AS-341317-PP-17

Accredited Air Emission Testing Body

A2LA has accredited

MONROSE AIR QUALITY SERVICES

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this organization is accredited to perform testing activities in compliance with
ASTM D7036 - Standard Practice for Competence of Air Emission Testing Bodies.

Presented this 2nd day of February 2016

Senior Director of Quality and Communications
Certificate Number 3925.01
Valid to February 28, 2018



This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.

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